ATTACHMENT 3

25X1

EXRAND-M-45

MEMORANDUM FOR: Chairman, EXRAND

SUBJECT   : EXRAND (TTT) Image Manipulation & Enhancement Report

    1. The following are notes briefly citing sources and describing EXRAND Technical Task Team inputs related to current R&D projects in image manipulation and/or enhancement.

    2. NPIC/⬜⬜⬜ III   25X1

        a. Digital Image Manipulation (DIM)

            (1) Scripps
            (2) In-house (TSG/RED/ATB/ITL/Peake/Carter)
            (3) ARPA - Patrick Air Force Base/Range Measurements Laboratory
(RML)⬜⬜⬜   25X1

        b. Optical Image Manipulation (OIM)

            (1) Tech/Ops - Optical Filtering
            (2) EIKONIX - Microscope Filter
            (3) Ingenuics - Contrast Doubler (Microscope)
            (4) Battelle - Contrast Enhancement Viewer/Printer

        c. Electronic Image Manipulation (EIM)

        d. Hybrid Image Manipulation (HYAIMS)

    3. CIA/ORD ⬜⬜⬜   25X1

        a. ORD/Optics Division

            (1) Image Enhancement Equipment

                (a) High Speed Micro/d (now at NPIC)
                (b) High Resolution Electron Beam Recorder (EBR) - delivery
            due in September 1971.

            (2) Raster Removal
            (3) Spatial Filtering
            (4) Contrast Enhancement
            (5) Degradation Compensation

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                (a) optical misalignment
             .(b) atmospherics
                (c) motion

          (6) Synthetic Apertures

     b. ORD/Analysis Division

         (1) DIM - new I/O techniques, software
         (2) Multiband Cluster Analysis (Area enhancement)
         (3) Improve signal-to-noise ratio

              (a) image quality
              (b) image edge (mensuration)

         (4) EIM - bandwidth compression also Image Data Compression
         (5) _____   **25X1**

    4. RADC/_____ - Infrared/Ektachrome color films combined   **25X1**
for detailed spectral reflectance data.

    5. NRTSC/_____(Input submitted separately at the   **25X1**
28 July 1971 EXRAND meeting - a significant DIM system is under development).

    6. Army/TOPOCOM/_____Info not yet received.   **25X1**

    7. The following agencies gave a negative response:

        a. AF SPP_____   **25X1**

        b. AF AL/

        c. DIA/Mr

    8. Conclusions. There is a wide range of efforts in the field of photo
image manipulation being carried on by the EXRAND community. Most of these
are keyed to specific requirements characteristic of the local reporting
agencies. However, the Digital Image Manipulation (DIM) Systems have a high
degree of flexibility and similarity, implying the need for careful coor-
dination in their development and utilization. Major DIM Systems are being
developed by NPIC, NRTSC, CIA/ORD, and ARPA.

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                   Chairman, Technical Task Team

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Distribution:
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        2 - Ch/Tech. Task Team